

ICP-MS Analysis Results

07-Jan-16

Instrument: Thermo X-Series2 Quadrupole ICP-MS

All water samples were filtered through clean (new) polyvinyl filters (0.45 um). A separate filter used for each sample. The first 10 mL of each sample was flushed through to condition the filter before collecting the 10 mL aliquot for analysis.

After filtration, the samples were acidified with 0.2 mL of 16 Molar Environmental Grade Nitric Acid.

The tuning and configuration of the ICP-MS was typical for solution analysis. All elements measured in "standard mode".

Internal standard solution containing Rh, In, and Re was added on line to correct for drift and matrix effects.

"FQ" indicates elements that were "fully quantitatively" determined, by external calibration standards.

"SQ" indicates elements that were "semi quantitatively" determined, by approximating sensitivity from fully quantitative calibration curves.

The certified reference river water standard SLRS-5 was run to test for method accuracy.

"ud" indicates results that were below the measured limit of detection ( 3 x standard deviation of the blank).

Samples AW-104 and -105 were prepared in the lab. -104 is tap water, treated the same as the samples. -105 is ultra pure water (deionized to 18.2 Mega Ohms)

All Results in parts per billion (ppb = ug/L)

	calibration method																														
	FQ	FQ	FQ	FQ	FQ	FQ	SQ	FQ	FQ	SQ	FQ	FQ	SQ	SQ	FQ	FQ	FQ	FQ	FQ	FQ	FQ	FQ	SQ	SQ	FQ	SQ	FQ	SQ	FQ	FQ	
	Li	Be	B	Na	Mg	Al	Si	P	S	Cl	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Rb	Sr	Y	Zr	Nb	Mo
SLRS-5	0.465	0.005	6.715	5366	2603	50.35	1730	3.665	2373	4935	845.7	11000	0.211	2.398	0.409	0.225	4.404	111.1	0.063	0.641	19.74	1.26	0.646	ud	0.454	1.308	53.33	0.11	0.022	0.004	0.224
AW-105 DI water	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud
AW-104 BWC Tap Water (filtered)	ud	ud	3.921	1774	1097	1.916	1676	ud	ud	3140	ud	5569	0.197	0.207	0.077	ud	3.823	26.99	0.035	2.117	2559	85.71	0.169	ud	ud	0.261	16.16	0.008	ud	ud	0.047
AW-101 Control at bridge (filtered)	ud	0.003	3.482	1850	671.8	42.75	2234	ud	ud	2050	ud	3607	0.29	0.484	0.178	0.148	2.479	22.74	0.038	0.169	0.922	2.931	0.101	ud	ud	0.197	14.2	0.076	0.08	ud	0.023
AW-102 Up Pond (filtered)	0.193	ud	18.62	13490	8283	6.142	3938	3.967	33320	12580	1549	16590	0.501	0.703	0.632	0.415	62.64	104.6	0.382	2.049	1.576	2.63	0.512	ud	0.177	1.034	224.2	0.014	0.017	ud	4.193
AW-103 Down Pond (filtered)	0.205	ud	17.17	13140	8133	5.541	3756	ud	32350	11960	1466	15160	0.497	0.681	0.63	0.384	68.23	98.81	0.423	1.97	1.183	1.829	0.474	ud	0.221	1.006	224.3	0.017	0.016	ud	4.147
CERTIFIED VALUES (information values)		0.005		5380	2540	49.5				10500			400.0		0.317	0.208	4.33	91.2	0.05	0.476	17.4	0.845		0.413		53.6				0.476	
uncertainty +/- ug/kg)				100	160	5									0.033	0.023	0.18	5.8		0.064	1.3	0.095		0.039		1.3				0.064	
OTHER PUBLISHED VALUES (http://georem.mpch-mainz.g)	0.46		6.66						2368				0.01	1.8									0.02	0.01		1.3	1.3	0.112	0.02	0.0036	
Limit of Detection (ppb)	0.055	0.003	0.267	0.864	0.556	0.179	698.242	3.080	713.931	372.639	3.148	2.649	0.024	0.081	0.008	0.084	0.006	1.106	0.002	0.004	0.006	0.543	0.001	0.037	0.050	0.002	0.010	0.001	0.008	0.001	0.002

	calibration method																															
	FQ	FQ	SQ	FQ	SQ	SQ	FQ	FQ	SQ	SQ	SQ	FQ	SQ	SQ	SQ	FQ	SQ	SQ	FQ	SQ	SQ	SQ	SQ	SQ	SQ	FQ	FQ	FQ	FQ	FQ		
	Ag	Cd	Sn	Sb	Te	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	W	Au	Hg	Tl	Pb	Bi	Th	U	
SLRS-5	ud	0.009	ud	0.398	ud	0.005	14.69	0.213	0.285	0.051	0.198	0.03	0.007	0.03	0.003	0.017	0.004	0.01	ud	0.01	ud	ud	ud	0.009	ud	ud	0.004	0.08	ud	ud	0.084	
AW-105 DI water	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud	ud
AW-104 BWC Tap Water (filtered)	0.019	0.025	ud	0.072	0.002	0.002	3.849	0.002	ud	ud	0.003	ud	ud	ud	ud	ud	ud	ud	ud	ud	0.002	ud	ud	ud	0.003	ud	0.003	3.863	ud	ud	ud	ud
AW-101 Control at bridge (filtered)	ud	ud	ud	0.017	0.002	ud	2.288	0.028	0.032	0.008	0.038	0.01	0.003	0.012	0.002	0.012	0.003	0.007	ud	0.006	ud	0.003	ud	ud	0.002	ud	0.014	ud	ud	ud	0.004	
AW-102 Up Pond (filtered)	ud	0.014	ud	0.219	ud	0.02	13.91	0.005	0.004	ud	0.005	ud	ud	0.002	ud	ud	ud	ud	ud	0.002	ud	ud	ud	0.011	0.003	ud	0.004	0.02	ud	ud	0.857	
AW-103 Down Pond (filtered)	ud	0.011	ud	0.201	0.002	0.017	14.01	0.005	0.004	ud	0.005	ud	ud	0.003	ud	0.002	ud	ud	ud	ud	ud	ud	ud	0.011	0.002	ud	0.004	0.015	ud	ud	0.879	
CERTIFIED VALUES (information values)				0.3			14																					0.081			0.093	
uncertainty +/- ug/kg)							0.5																				0.006				0.006	
OTHER PUBLISHED VALUES (http://georem.mpch-mainz.g)	0.007	0.005				0.005																	0.014				0.0009	0.01				
Limit of Detection (ppb)	0.002	0.001	0.030	0.002	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.010	0.001	0.002	0.001	0.015	0.001	